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BEFORE THE

FEDERAL COMMUNICATIONS COMMISSION

WASHINGTON, DC 20554

RE: 100% OVERLAP DISCUSSION

Analysis of JMZ/Kwikom coverage in the LaHarpe Telephone Company Exchange

Methodology

On Aug. 24 and 25, 2015, a field trip was made to the LaHarpe telephone exchange and surrounding areas to test several locations to measure whether KwiKom could provide voice and data service to selected homes. Initially on Aug. 24, KwiKom transmitter sites where identified. At these sites, approximate centerline and azimuths of the sector antennas were recorded. The transmit frequency and channel bandwidth of the sectors that pointed toward relevant areas of the LaHarpe Telephone exchange were recorded. Sites were identified in or near the following communities: Colony, Carlyle, Iola, Humboldt, LaHarpe, Elsmore, and Moran. Most of the sectors at the transmitter locations visited were mounted on water towers. One site appeared to be using omni antennas instead of sector antennas. Pictures were taken of each transmitter location and are shown in the accompanying Exhibit A. The GPS coordinates of the transmitter sites can be found in Exhibit B.

A Tektronix RSA306 USB spectrum analyzer was connected via USB 3.0 cable to a laptop running an Intel Core i7 processor and 8GB of RAM running the Tektronix SignalVu-PC software. The DPX Spectrum view was used to record signal measurements. A directional panel antenna was connected to the spectrum analyzer with a 3/8" coax cable. A separate panel antenna was used for measuring 2.4Ghz and 5.8GHz. The centerline of the panel antenna varied between 4ft. and 20ft. above ground level depending on the location being tested. To achieve a centerline of 20ft., the antenna was mounted to an extension pole 12ft. in length. The pole was held by a person standing on the top of the pickup bed.

A Ubiquiti NanoBridge M5G25 was also used as part of the testing. This is the same model that is installed at some KwiKom customer locations. Using the scan feature of the device, SSIDs were identified at certain of the transmitter sites; this information was used to determine if the same SSIDs were present at the potential customer locations. The NanoBridge M5 was helpful in determining the frequency transmitted to allow viewing in the Tektronix spectrum analyzer. The NanoBridge M5 scanned channels ranging from 5.16Ghz to 5.84GHz. The centerline ranged from 4ft. to 20ft. above ground level. The same method mentioned above was used for achieving the 20ft. centerline.

Exhibit C contains screenshots of GPS locations, spectrum analyzer measurements, and Ubiquiti NanoBridge M5 scan results. Transmitter locations have been identified. Signal verification for transmitter sites are included showing that signals from the test locations can be seen with the spectrum analyzer. In addition to using the spectrum analyzer to determine frequency, in some cases frequency was determined by identifying the model number of the CPE. For example, there are several locations south of the North Iola site where CPE is near the right-of-way and readily accessible. At one location, a KwiKom sign was found near the CPE. See pictures 11 – 13 for details.

After visiting each transmitter location, a list of specific household locations within LaHarpe Telephone Company's study area was reviewed. Four locations were acknowledged on KwiKom's online coverage map not to have KwiKom service available and were not measured. A fifth household shown by KwiKom as not covered was tested and the absence of signal was confirmed. At eleven other household locations where KwiKom's coverage map indicated coverage or possible coverage, a specific signal strength measurement was conducted. Using the spectrum analyzer, Ubiquiti NanoBridge M5, or combination of both, signals were searched from transmitter locations in all directions that could potentially serve the eleven tested locations. In some locations, 2.4GHz and 5.8GHz were tested while

other locations were only tested for 5.8GHz signals. The reason for testing these signals was due to the location of the testing in relationship to transmitter locations and what frequencies were indicated to be transmitted from the transmitter location. Both 2.4GHz and 5.8GHz signals were not being transmitted at all transmitter sites. GPS coordinates were recorded of the locations where the test was performed. In some cases, due to access and private property considerations, the test was performed at locations adjacent to the household. In such cases, locations were identified minimizing physical factors (e.g. vegetation and terrain) that would adversely affect signal strength. In each such case, the locations at which measurements were taken were less likely to be subject to degradation of the signal strength than would be true at the adjacent household itself.

Conclusion

Many of the locations tested had heavy tree presence partially or wholly surrounding the household; many were sited in lower lying areas. Due to distance, terrain, and/or heavy foliage, a signal sufficient to provide the subject service (voice plus data service at a rate of 10 Mbps downstream and 1 Mbps upstream) was not present. Three of the locations were in areas claimed on KwiKom's coverage map to have service available. It was not clear from KwiKom's online map whether KwiKom's map claimed service to be available at eight remaining tested household locations. Measurement showed no sufficient signal at any of the eleven households tested. Either signal strength measurement or KwiKom's own public coverage information, or a combination of the two, shows at least fourteen household locations in eleven separate census blocks in the LaHarpe study area where no KwiKom coverage is present. Exhibit C contains additional documentation and notes from potential KwiKom customer locations within the LaHarpe telephone exchange. Screenshots are included illustrating test locations and findings. Exhibit B identifies specific household locations, their respective census blocks and a determination for each as to KwiKom service availability.

Sincerely,

Kyle Wallace

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